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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/852,482	05/10/2001	Francis Wong	P5760	4933

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EXAMINER	
HOGAN, MARY C	
ART UNIT	**PAPER NUMBER**
2123	

DATE MAILED: 09/28/2004

3

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/852,482	WONG ET AL.	
	Examiner	Art Unit	
	Mary C Hogan	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *1/25/02*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-31* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-31* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 May 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 2.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This application has been examined.

2. **Claims 1-31** have been examined and rejected.

Specification

3. The disclosure is objected to because of the following informalities. Appropriate correction is required.

4. Page 1, line 7 should read "conventional HDL languages".

5. Page 2, line 7, (RTL.) should be (RTL).

6. Page 2, line 8, "described at using" should read, "described using".

7. Page 5, lines 9-11 refer to DUT as element 106 in Figure 1 when it should refer to element 104.

Claim Interpretation

8. **Claims 4-10, 14-20 and 24-30** are directed to an "ingress" and "egress" section. It was concluded from the description in the specification and the definitions of ingress and egress (ingress: a means or place of entering; egress-a path or opening for going out, an exit; The American Heritage College Dictionary, pages 447 and 713) that the ingress and egress sections refer to a path for the packets to enter or leave the network verification mechanism.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. **Claims 1,4-10,11,14-20,21,24-30** are rejected under 35 U.S.C. 103(a) as being unpatentable over Parker (U.S. Patent Number 5,822,520), herein referred to as **Parker** in view of Dawson et al (**Dawson** et al, "Probing and Fault Injection of Dependable Distributed Protocols", The Computer Journal, Vol. 38, No.4, 1995, pages 286-300), herein referred to as **Dawson**.

12. As to **Claims 1,11,21 and 31**, **Parker** teaches: an apparatus for configuration independent simulation of network layer conditions in a simulated network that transmits data packets between a DUT and another component, the apparatus comprising:

a network layer verification mechanism connected between the DUT and the other component **(Figure 6, element 604,** wherein the DUT is the Network Layer, **614** and the other component is the virtual device layer, **610** which simulates the functions of actual network protocol layers**)**; the network layer verification mechanism having a storage **(Figure 5, elements 516,518,520 and column 7, line 65-column 8, line 6** wherein the facility for generating packets includes storage for libraries that contain instructions for a given protocol); and a plurality of methods for selectively forwarding data packets between the DUT and the other component **(column 16, lines 5-6,** "devices for transmitting test packets"); and an API interface for invoking the methods to simulate conditions that can occur in the network **(Figure 5, element 512 and description).**

13. **Parker** does not expressly teach the API interface simulating dropped packets, duplicate packets, corrupted packets, out-of-order packets and delayed packets.

14. **Dawson** teaches the insertion of a script-driven probe/fault injection (PFI) layer between two layers in a protocol stack that drops, duplicates, delays, corrupts (modify) and creates out-of-order (reorders) packets **(page 287, column 1, paragraph 2)**, in order to study the behavior of distributed systems and to detect design and implementation errors of fault-tolerant protocols by injecting faults into the system to emulate behavior that may be impossible to achieve under normal operating conditions **(page 287, abstract and Introduction, bullet 3)**.

15. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the simulation of conditions by the API as taught in **Parker** to include the simulation of

dropped packets, duplicate packets, corrupted packets, out-of-order packets and delayed packets as taught in **Dawson** since **Dawson** and **Parker** are both directed to testing of communications between protocol stacks and the method in **Dawson** enables the emulation of behavior in fault-tolerant protocols that may be impossible to achieve under normal operating conditions **(page 287, abstract and Introduction, bullet 3).**

16. As to **Claims 4,14 and 24, Parker** teaches the network layer verification mechanism comprises a packet ingress section and a packet egress section **(Figure 5, elements 504,506,508,510 and description, Figure 6, elements 604 and 600).** From these figures, it can be seen that the packets 504, 506 and 508 are in bi-directional communication with the packet management function generator that uses input from the user to modify or create the test packets. It is noted that these packets that are input to element 510 must be stored in a temporary buffer until element 510 is ready to process it. This input of the packet to element 510 through the bi-directional communications and the necessary temporary storage of these packets in a buffer encompass an ingress section. Figure 6 shows bi-directional communication between elements 604 and 600 including between the packet shell generation facility and the Transport Layer and Device Layer that parse and format data and transmit it to the network. It is noted that packets, when modified or created in element 604, must be stored in a temporary buffer until ready to be transmitted to element 602 and further, the packets must again be stored in a temporary buffer after the parsing and formatting until ready to be transmitted out to the network. This bi-directional communication between elements 604 and 602 and the buffers that are necessary to temporarily store the data before transmission encompass an egress section. Further, **Parker** discusses "packet buffers" in which packets are stored **(column 10, lines 66 and column 11, lines, 54-55).**

17. As to **Claims 5,15, and 25, Parker** teaches: the apparatus of claim 4 wherein the API interface includes a method for transmitting packets between the packet ingress section and the packet egress section **(column 13, line 59-column 14, line 34, column 16, lines 5-6**, "receive" and "send" the packet).

18. As to **Claims 6,16,and 26, Parker** teaches apparatus of claim 4 wherein the API interface comprises a method for transmitting packets between the packet ingress section and the storage **(column 10, lines 66 and column 11, lines 8-9, 54-55).** Since it is shown that packets can be received, and that packets are stored in packet buffers, it is noted that there must be means to transmit a packet that is received through the ingress section to a buffer.

19. As to **Claims 7,17 and 27, Parker** teaches apparatus of claim 4 wherein the API interface comprises a method for transmitting packets stored in storage to the packet egress section **(column 10, lines 66 and column 11, lines 8-9, 54-55).** Since it is shown that packets can be sent, and that packets are

stored in packet buffers, it is noted that there must be means to transmit a packet that is in storage (or in a buffer) to the packet egress section for transmission.

20. As to **Claims 8,18 and 28**, **Parker** teaches: the apparatus of claim 4 wherein the API interface comprises a method for retrieving a packet stored in the storage **(column 12, line 30** wherein the raw packet read retrieves a packet from storage and displays its contents**)**.

21. As to **Claims 9,19 and 29**, **Parker** teaches: the apparatus of claim 4 wherein the API interface comprises a method for modifying a data packet received at the ingress section **(column 17, lines 29-31)**.

22. As **to Claims 10,20 and 30**, **Parker** teaches: the apparatus of claim 9 wherein the API interface comprises a method for restoring a modified data packet in the storage **(column 17, lines 29-31)** wherein modifying packet data structures in storage encompasses modifying the information so that the original packet information is restored.

23. **Claims 2,3,12,13,22 and 23** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Parker and Dawson** as applied to **Claims 1,11 and 21** above, and further in view of Daniel Chapiro (Chapiro, Daniel, "Automating Verification Using Testbench Languages", Electronics Engineer, September 1999), herein referred to as **Chapiro**.

24. As to **Claims 2,12,22**, **Parker and Dawson** teach the network layer verification mechanism is implemented by a scripting language **(Parker: column 9, lines 64-66, Dawson, page 288, section 3, paragraph 3)**.

25. **Parker and Dawson** do not expressly teach the network layer verification mechanism is implemented as a specialized object written in an HVL.

26. **Chapiro** teaches the use of as hardware verification language (HVL), such as VERA, that consist of objects that can be used to create reusable testbenches and that can enable the launching of thousands of transactions concurrently to stress the design and generate realistic boundary conditions **(page 3, "HVL Features")**.

27. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the implementation of the network layer verification mechanism as taught in **Parker and Dawson** with a specialized object written in an HVL such as VERA since HVL objects can be used to create reusable testbenches and can enable the launching of thousands of transactions concurrently to stress the design and generate realistic boundary conditions as taught by **Chapiro (page 3, "HVL Features")**.

28. As to **Claims 3,13, and 23**, **Parker** teaches the object includes internal storage in the form of an associative array **(Figure 5, elements 516,518,520 and column 7, line 65-column 8, line 6** wherein the

facility for generating packets includes storage for libraries that contain instructions for a given protocol) and a plurality of methods that allow packets received by the object to be selectively forwarded through the object (**column 16, lines 5-6,** "devices for transmitting test packets").

Conclusion

29. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

30. Oskouy et al (U.S. Patent Number 5,673,279) teaches verifying a network transporter under test by posting test packets and utilizing one or more FIFO buffers to store packets.

31. Chen et al (U.S. Patent Number 6,549,882) teaches the generation of packets used to provoke responses in order to model or test proper operation of one of more network protocols.

32. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mary C Hogan whose telephone number is 703-305-7838 or 571-272-3712 starting mid-October 2004. The examiner can normally be reached on 7:30AM-5PM Monday-Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska can be reached on 703-305-9704. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mary C Hogan
Examiner
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